

Experts criticise study linking chemical BPA with baby brain problems

February 26 2013, by Sunanda Creagh



Experts have called for a cautious interpretation of a study's finding that exposure to the plastics chemical BPA was linked to baby brain development problems. flickr.com/photos/ninedragons

A [new study](#) that found the common plastic ingredient bisphenol A (BPA) may harm a baby's brain development in-utero has been described as 'misleading' and 'not relevant' by Australian experts.

[BPA](#) is a chemical used in the lining of some food and beverage packaging to protect food from contamination and extend shelf life, according to the Food Standards Australia New Zealand [website](#). It can seep into foods and drinks in small amounts.

A new study by US researchers, published today in the journal [PNAS](#), found that [BPA](#) may inhibit expression of a gene involved in the development of the central nervous system while a baby is still an embryo.

"Our study found that BPA may impair the development of the [central nervous system](#), and raises the question as to whether exposure could predispose animals and humans to neurodevelopmental disorders," lead author Wolfgang Liedtke, associate professor of medicine/neurology and [neurobiology](#) at Duke University Medical centre said in a [statement](#) released by the university.

The study centred on a protein called [KCC2](#), which normally helps reduce the amount of [chlorides](#) in the [embryonic brain](#) as neurons develop.

When KCC2 levels are insufficient, the [chloride levels](#) remain too high and can damage [neural circuits](#) and prevent a nerve cell from settling in the correct position within the brain.

The study found that BPA exposure suppresses a gene needed to make the right amounts of KCC2, leading to problematic levels of chlorides.

The authors said that this may be because BPA exposure drives up levels of another protein called [MECP2](#), which helps inhibit function of the gene needed to make the right amounts of KCC2.

The researchers found that female neurons were more severely affected

by BPA exposure than male neurons.

"Our present findings, in which we are recording related results in rat, mouse, and human neurons, raise the question of whether BPA exposure could predispose to neurodevelopmental disorders including autism-spectrum-related diseases," the study said.

Experts urge cautious interpretation

In comments released by the [Australian Science Media Centre](#), Australian experts urged caution in interpreting the new findings.

"This is a very interesting study. Unfortunately, it's linkage to environmental exposure to Bisphenol A is misleading, in that the concentrations used in this study are hundreds to thousands of times higher than humans would be exposed to through the maximal permissible level of BPA in food," said Dr Ian Musgrave, Senior Lecturer in the Faculty of Medicine at the University of Adelaide.

"Thus this study, while it throws light on aspects of gene regulation, is not relevant to human exposure to this chemical."

Professor Andrew Bartholomaeus, Adjunct Professor of Toxicology and Pharmacy at the University of Canberra's School of Pharmacy said researchers used "techniques that bathe excised tissues in BPA, in a form not found in the body from BPA consumed in food, in a non-physiologically meaningful environment."

"BPA consumed in food or drink is rapidly and essentially completely metabolised before it enters the blood stream so cells within the body are not exposed to free BPA," he said.

"The effects claimed to be caused by BPA in many of the references

cited were produced by injecting BPA directly into the body of animals or directly into the blood stream and are therefore not relevant to human [exposure](#) to minute levels of BPA in the [food](#) or drink consumed."

Professor Ian Rae, Honorary Professorial Fellow in the Faculty of Arts at the University of Melbourne and Former President of the Royal Australian Chemical Institute said further research was needed.

"The clinical results show that sensitive tissues exposed to very low concentrations of BPA experience adverse effects. It is not clear whether these tissues would ever be exposed in this way given normal ingestion patterns and known elimination pathways for BPA," he said.

"Population studies are impossible, of course. Studies listed on the website of [Food Standards Australia New Zealand](#) have indicated very low levels of threat from BPA toxicity, but it would be prudent for them to be revisited from time to time since this is an active area of clinical research and new findings need to be carefully assessed."

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Source: The Conversation

Citation: Experts criticise study linking chemical BPA with baby brain problems (2013, February 26) retrieved 6 May 2024 from <https://medicalxpress.com/news/2013-02-experts-criticise-linking-chemical-bpa.html>

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